The MAC Flyer

MAY 1974

Squawk Mode Charlie-the modern way to go. Page 16

MILITARY AIRLIFT COMMAND

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The MAC Flyer

For Greater Efficiency
in MAC Air Operations

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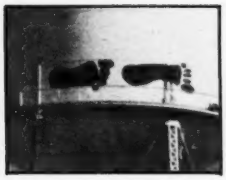

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COVER: A mode charlie equipped WC–135 returning from overseas prepares to enter high density airspace.

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Got a Red Hot Emergency? Cool It

Rushing emergency procedures without first engaging your brain could affect your life expectancy.

Regardless of the type of aircraft he flies, a pilot's first priority during any inflight emergency should be to maintain aircraft control. Come hell or high water, keep the machine flying!

As long as an aircraft is sound — the flight controls are functioning and power plant(s) are generating sufficient thrust — it is capable of flying. But it won't fly long unless the pilot fights off the tendency toward distraction under the pressure of an emergency.

There's not much a pilot can do in the way of trouble-shooting if the basic aircraft structure fails, the flight controls become completely inoperable or total propulsion loss occurs. Fortunately, such instances are few and far between.

But some pilots, faced with even the most common emer-

COOL IT — continued

gencies, begin to relinquish aircraft control in favor of pulling "T" handles and flipping switches without first engaging their aeronautical memory banks.

Why do so many fliers tend to hurry emergency procedures? Perhaps it is their innate desire to return their environment to normal as quickly as possible, or their fear of forgetting emergency procedures unless they are immediately implemented.

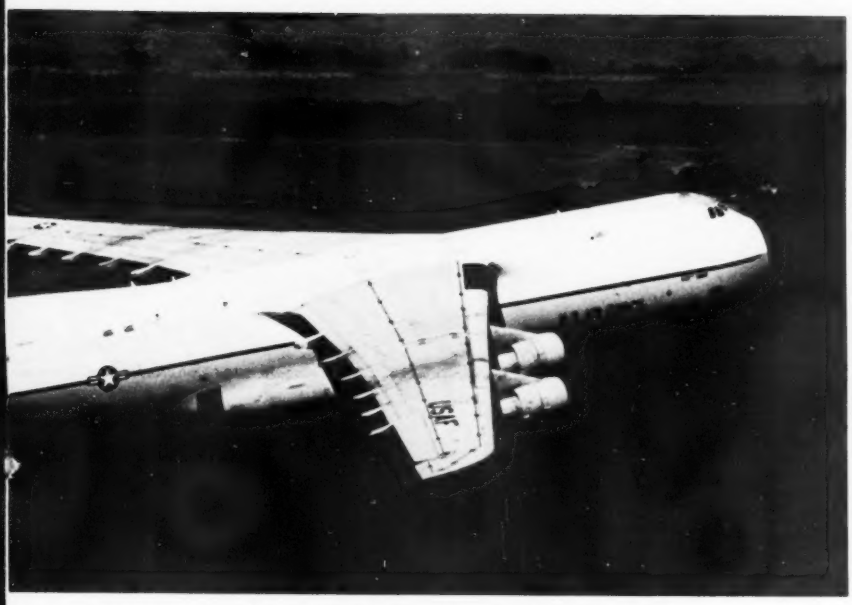
One likely explanation is that these hasty motions and habit patterns may have evolved from die-hard techniques lingering from the days of older aircraft, when quick response was more essential than it is in modern jets.

Contemporary aircraft system designs make rushed emergency actions mostly unnecessary. Modern airplanes and helicopters in today's MAC fleet reflect the latest advancements in system technology and safety design philosophy.

Jet engine power reserve has permitted installation of secondary and tertiary backups for electrical, hydraulic, and pneumatic systems on most contemporary aircraft. Years ago, weight and power limitations precluded installation of elaborate backup systems. An engine loss on a grossed-out C-124 was an extremely serious situation. On a hot day, a burdened Old Shakey on takeoff could just barely hang in there on four engines, let alone three. A C-124 pilot often didn't have the luxury of time to diagnose engine problems or other malfunctions. He faced such immediate possibilities as runaway props, engine seizures and the problem of clearing the trees. A G-rotor pump failure caused almost instant loss of all engine oil. An electrical problem on a C-124 could cause its engine-driven generators to trip off the line in rapid succession. The electrical backup was either a troublesome, unreliable gas turbine power unit or a small reciprocating auxiliary power plant. The margin of safety in those days (and even today for older aircraft — ask some of the Air National Guard jocks who still fly Shakey) was not what it is on newer birds. To keep an aircraft flying often required a stacatto of commands to a flailing engineer. An engine fire meant flames licking at a wet wing full of 115/145 aviation gasoline; the position of engines on most jets alleviates that problem.

Safety margins on today's jet transports are actually too great for meaningful comparison with prop jobs. The major differences are in engine simplicity, reliability, and flight control redundancy. Each aileron, rudder, and elevator on newer jets is powered by at least two, and possibly three, independent hydraulic actuators pressurized by separate hydraulic systems. It seems there are at least two or three of everything on board today's aircraft. Three or four hydraulic systems, engine driven generators capable of sole support of practically the entire aircraft electrical system, dual independent pressurization systems, dual independent flight director systems, and secondary communication and navigation systems, are just a few examples of how the aircraft industry has minimized the gravity of most in-

Lose an engine on takeoff in Shakey and be ready to react.



Modern jets offer pilots time to think problems through.

flight system malfunctions.

The day when "prompt" action meant hurrying is a thing of the past. Today, hurrying could mean stumbling headlong into something which might be regretted later.

Evaluation is far more important than speed. For example — should a jet engine be shut down solely because of indicated low oil pressure? Certainly, flight conditions permitting, if oil quantity decreases and oil temperature rises. However, with oil quantity and temperature stable, the problem could be a faulty oil pressure transmitter rather than a bona fide pressure problem. How about the guy who spots an illuminated elevator system power light on the master annunciator panel and misinterprets this as a hydraulic system failure — and quickly directs the isolation of a properly functioning hydraulic system when the problem was simply a faulty elevator actuator.

These examples, while simple, point out why it is necessary to spend a few moments analyzing all inputs and indications and, perhaps, talking things over with other crew members before taking action. No one person in a MAC jet has all of the systems indicators and all the answers. A hastily pulled handle or flipped switch might shut down more than was bargained for.

System Interdependency

Many current aircraft systems are dependent upon other systems for operation. Flight controls on the C-5, C-141, and H-53 are dependent on multiple hydraulic actuators pressurized by multiple hydraulic systems. On some aircraft, pressurization is accomplished by independent air conditioning packs, but these packs are dependent upon engine bleed air inputs for operation. Most aircraft systems follow a domino-like system dependency.

Hurried, uncalculated emergency reactions in the cockpit are likely to isolate essential systems and could produce a new situation worse than the original. One of the best ways to accomplish malfunction analysis is by referring to the Dash One.

Fly It

Emergency conditions can confront a pilot during any phase of flight. Some phases, like departure, approach, takeoff, and landing, are certainly more critical and demanding than transient and cruise phases. But a pilot's first duty and priority during all phases of flight is to maintain aircraft control. Keep it flying — on course, and at designated altitude.

Corrective actions come in various forms — bold print emergency procedures for critical problems and reference checklists for more detailed follow-up. The former is cut and dried. The latter requires collaboration between various crew members and sometimes reference to either an abbreviated checklist or expanded procedures in Section III of the Dash One. The Dash One often indicates not only how to solve a problem but also just which system components are still functioning. There are pilots who feel that reference to the Dash One in flight indicates ignorance. But most of the real professionals realize that referring to manuals can be insurance against human fallibility.

The next time you experience an emergency, remember — first, maintain aircraft control; then, analyze the problem, initiate corrective procedures, and take inventory of what you have and don't have. And think. Don't rush.

In other words, cool it.

by Capt Janie L. Martin, USAFR

Airborne on a

Destination–Siberia. An Air Force Reserve Nurse recounts her experience on one of MAC's most unusual air evac missions.

It was the most intriguing and exciting adventure of my life!

I had been sent to Germany to pull two weeks of alert duty with the 58th Aeromedical Evacuation Squadron from McGuire AFB, N. J. I was at Rhein-Main AB when I got the call: "Pack for a seven-day trip . . . You're going on an urgent aeromedical evacuation mission," said the voice at the other end of the line.

Three hours later I met with the medical crew at the squadron building. WOW! Our destination was Irkutsk, Siberia. Mission: Pick up a patient named James Torrence who was in Russia as part of a cultural exchange group. He had suffered a massive internal hemorrhage from a torn esophagus. This would require blood transfusions so we began planning the type supplies we would need to care for him.

As soon as we were ready, we departed Rhein-Main in an unmarked C-141. The entire crew traveled in civilian clothes.

I felt a little uneasy being an American flying across Russia. It was October 23, the height of the confrontation between the U.S. and the U.S.S.R. over Russia's threat to send 50,000 troops into the Middle East. Several of us looked out the window to see if we had a MIG escort . . . there was none.

Five hours later we landed in Moscow for refueling. We were told to remain on board the plane during our stop. The excitement of being there and not even able to touch the ground was more than I could stand. When the American attache boarded, I asked him if it would create a national incident if we stepped on the ground. He said he didn't think so as long as we didn't leave the vicinity of the aircraft.

We crunched around in our first snow of the year and threw a few snowballs at each other. The refueling truck came and we witnessed a little women's lib in Russia . . . one of the refuelers was a woman.

After two hours on the ground, we departed for Irkutsk with an English-speaking, Russian navigator and an American attache. My co-flight nurse, Capt Barbara Roe, and I attempted to sleep on the next leg of the flight. We knew we had many hours of work ahead of us.

Irkutsk was our only daylight stop. Snow covered the ground and the many buildings along the approach. None of the buildings appeared more than five stories high. There was a clear blue lake nearby.

Russian Odyssey

We taxied to the parking ramp. The workers outside stared at us. Ours was probably the first American plane any of them had ever seen.

We opened the petal doors to remove equipment needed to obtain the patient. The Russians must have taken this as a friendly gesture because they swarmed around the rear of the plane, looking at us, talking, and laughing. It gave me the feeling I was in a zoo. Of course, we did a little looking and talking of our own.

These people left a big impression on me. Their friendliness was spontaneous. One of the medtechs responded by offering the Russians some root beer.

Mr. Torrence arrived in an ambulance and in no time we were on our way. The rest of the flight was quite busy. Our patient had been operated on seven days earlier to stop the bleeding. He appeared tired but relieved to be going home. We administered blood and oxygen during the entire flight. It was a thrill to watch his improvement.

Our last stop in Russia was Khabarovsk where we dropped off the Russian navigator.

Twenty-two hours after our adventure began we landed at Yokota AB, Japan. Mr. Torrence was transferred to the hospital. He had greatly improved and was able to sit up for the first time in five days.

A climax of the mission was the following message we received:

"The U. S. Embassy, Moscow, and the U. S. Defense Attache Office particularly express their deep appreciation and highest respect for the outstanding accomplishment of your wing and the entire Military Airlift Command in the recent air evacuation of James Torrence from Irkutsk, U.S.S.R., to Yokota, Japan.

"Medical authorities advise that the mission was lifesaving. The patient's condition markedly improved after transfusion of American blood. Beyond the infinite value of life saving, the good will, and professional impact on the Soviet government and personnel generated by this successful mission merit official recognition."

My fellow crew members making the flight were Capt Grover Rawlings (aircraft commander); Maj Donald Eggerman and Capt Thomas Hurd (copilots); 1st Lt Jimmy Jackson (navigator); and, SSgts Stephen Long and Wayne Spencer (loadmasters) — all reservists assigned to 514th MAW, McGuire AFB, N.J.

The other crew members were on active duty assigned to the 438th Military Airlift Wing, also at McGuire. They were 1st Lt Scott Jenkins (navigator) and TSgts Raymond Parry, Jr., and Charles Warden (flight engineers).

The active duty medical team consisted of Col (Dr.) Homer Woosley, chief Flight Surgeon, U.S. Air Forces in Europe; Maj (Dr.) Richard Woltersom (a flight surgeon at Rhein-Main); Capt Barbara Roe (McGuire AFB); and, SSgts Robert Tokarski (Rhein-Main) and Ralph Noldan, Jr., (McGuire AFB).

— THE AIR RESERVIST

Letters To The Editor

We're Number One

We in the 76th Military Airlift Squadron were pleased to see the article in the "Global Notes" section of THE MAC FLYER congratulating the 89th MAW for 25 years and 475,000 hours accident-free flying. This is a significant accomplishment and deserves special recognition. However, while 25 years may represent a record, the flying hours do not.

The 76th Military Airlift Squadron, Charleston AFB, holds the current Air Force and possibly world safety record. As of 31 January 1974 we surpassed 590,000 hours of accident-free flying over a period of 21 years. We are especially proud that we have achieved this record flying both tactical and strategic airlift missions, over worldwide routes, and, at times, in hostile environments. In addition the average flying experience per pilot is 1,300 hours.

The official motto of our squadron is "Safety, Spirit, Service." "The Spirit of 76" is proudly displayed on the President's VC-137. It also lives in the 76th Military Airlift Squadron. We add our congratulations to the 89th Military Airlift Wing.

Robert W. Stobbe, I/LT, USAF
76 Military Airlift Squadron
Charleston AFB, S.C.

★ And ours to the 76th MAS for its outstanding accomplishment. Records at MAC show that your squadron holds the MAC squadron record for total accident-free flying hours. For awards purposes, the 436 MAW at Dover AFB holds the current MAC wing flying record of 920,433 accident-free hours (as of 31 December 1973). Although the 436 MAW experienced accidents while accumulating this total, none of its assigned or attached personnel were charged with an accident cause factor (MACR 900-1).

IFR Taxiing?

Reference THE MAC FLYER, January 1974. Another good issue!

I would like to inquire concerning the After Deadline SOF Reports, page 31. When the fog was so dense the AC could not see the yellow line, how did the SOF receiving your commendations take care of things like seeing the wing tips? It appears that safety was somewhat compromised for operational expediency. Is this what we really want to promote in THE MAC FLYER? I note the masthead that originally read "To Gain Greater Efficiency and Safety in Air Operations" no longer contains any reference to safety.

Raymond L. Kuhlman, Lt Col, USAF
Chief of Safety
443d Military Airlift Wing

★ The SOF report to which you refer indicated only that taxiing was difficult, not unsafe. It seems unlikely that a SOF concerned enough to call for a transient alert vehicle would allow the big bird to taxi in fog so dense that the crew couldn't see its wing tips. The masthead was changed in January 1972 under the accepted premise that the safe method of operating is the efficient way.

Not So Weird Ice

Here is a possible cause of the C-5's weird ice reported in "Quick Stoppers" of December's THE MAC FLYER. Start with water at 4° C (39 F) on the aircraft. As takeoff roll begins, the resulting wind across the aircraft causes the water to puddle (possibly against some projection on the aircraft surface) and at the same time increases the rate of evaporation of the water. If the water puddles to a depth of 0.40 centimeter and 0.05 centimeter evaporates, enough heat is absorbed in the evaporation to cause the remaining 0.35 centimeter (slightly more than 1/8 inch) of water to freeze.

The depth of the water puddle (d) in centimeters, the depth of water to be frozen (d') in centimeters, and the temperature (T) in degrees celsius are approximately related by:

$$597.3\ (d\text{-}d') = 79.7\ d' + \frac{(d+d')T}{2}$$

The term on the left is the amount of heat (in calories) required to evaporate (d-d') centimeters of water; the first term on the right, the heat released by freezing d'cm of water; the second term on the right, the heat released by cooling the water from T to 0°C, all over a surface area of one square centimeter.

Jackson E. Smith, Captain, USAF
Chief Forecaster
Det 12, 7th Wea Sq (MAC)
APO NY 09185

★ Thanks for your explanation. However, the formula you quote could well cause a run on math books.

A Marine View on the C-130 Prop

Your MAC FLYER is a widely read publication and one which contributes vast interest in aviation safety. It is certainly welcomed in VMGR-152.

I would like to contribute my "two-cents worth" in answering some questions that appeared in your September issue by Capt William Crielly, Jr. I realize this may be a little late but maybe it could be of some useful help to him and other C-130 drivers. First, I would like it to be known that I am no aero engineer, but I hope to shed some light on his problem.

Propellers have no idea what air-

speed you are indicating in the cockpit on your airspeed indicator, and they are completely unaware of any airspeed indicator error that may exist due to pitot tube placement on the aircraft.

The only thing the propeller knows is true airspeed (equivalent airspeed corrected for density), that particular number of molecules of air flowing over its surface. In other words, 150 TAS at flight level 200 has the same number of molecules of air flow over the surface as 150 KTAS at 5,000 feet.

As for propeller emergencies, if the propeller pitch locks at altitude, the propeller now has a fixed pitch in the sense that it is unable to decrease pitch due to the pitch lock ratchet rings being held together by spring force. At this point we no longer have a constant speed engine and we operate between 96 to 98 r.p.m. Now as we decrease in altitude and if we maintained a constant IAS, the blade angle is fixed and the molecules of air become more dense, and as they do they will increase the load on the propeller and reduce engine r.p.m. Of course, if r.p.m. is allowed to decrease to below 94 percent, the fifth and tenth acceleration bleed air valves will open, and the engine will flame out.

Now, if we maintain a constant TAS at which the pitch lock occurred, we will keep the same number of molecules of airflow over the propeller and the propeller load will not affect the engine. However, temperature and altitude will affect the performance of the engine also, and throttle movement will be necessary to maintain 96 to 98 percent.

As for the recommended speed for feathering a propeller with an undetermined malfunction, this is merely to make certain you are in the pitch lock range (150 KTAS) 25 degrees to 55 degrees prop blade angle.

I certainly hope this will answer Capt Crielly's questions and once again I say I am no engineer.

Capt P. J. Unruh
Aviation Safety Officer
Marine Aerial Refueling
Squadron 152

The Crew Commander

A new word has entered the MAC vocabulary — crew commander. What is a crew commander and how is he different from the guy we have always known as the aircraft commander? We in MAC are adopting a concept which is new to most of us airlifters — It is called integral crews. With the integral crew comes a new chain of command for our line crew members. A new commander's position has evolved from this system — the crew commander. He is and must be a commander in every sense of the word, and we are giving him all the authority and responsibility that goes with command.

Unlike the aircraft commander of the past who was responsible for an aircraft and crew while he was out in the system, the crew commander is the immediate supervisor and reporting official for each member of his crew 365 days a year. He is responsible for their training, conduct, appearance, and well being. He is their commander!

The crew commander is the key to successful operation of the integral crew concept. He will be carefully selected for his leadership ability, flying ability, and seniority. He will have to demonstrate his ability to command or he will not be retained as a crew commander. The importance of this position cannot be overstressed. The MAC crew commander is going to be given much more responsibility than ever imagined in the past. He will be the one man primarily responsible for moving his mission through the MAC system, and he will have to answer directly for every decision he makes.

As the first line supervisor for each member of his crew, the crew commander will have to know each of his subordinates and their jobs to a much greater extent than ever before. As a result, the crew commander will be given the very important responsibility of rating each of his crew members. While this does enhance his authority, we are not giving the APR/OER responsibility to the crew commander only for that reason. We think that the crew commander is in the best position to judge each of his crew member's performance in his primary duty as a member of the finest and most professional aircrews in the Air Force today.

The challenge for the new commander is great, but the benefits are equally great for those who are willing to accept the responsibility. Each pilot in the Military Airlift Command now has the opportunity to accept that challenge and that responsibility. The job of crew commander will be the most demanding job in MAC, but it will also be the most rewarding. I am certain that those who are fortunate enough to be selected as crew commanders will live up to the confidence we are placing in them and, the Military Airlift Command will benefit a great deal from their leadership.

Capt Robert J. Boots
Aide to Commander
21st Air Force
McGuire AFB, New Jersey

An Open Letter on the Overconfidence Syndrome

Dear Fellow Pilot:

The "Overconfidence Syndrome" strikes again! What is it? First of all, it's a potential killer. It usually strikes without warning like an invisible, odorless poison gas. It can lull you into a sense, of false security, overshadow your common sense and cause you to make decisions inconsistent with standard procedures. The frightening aspect, however, is that it normally afflicts our most experienced pilots. Let me cite an actual incident.

An aircraft carrying 20 passengers recently departed its last enroute stop on the final leg home. The aircraft commander was a senior pilot with 14 years of rated service, more than 6,000 hours total flying time, and over 1,400 hours in this particular bird. Having had prior experience as an instructor pilot, flight examiner, and simulator instructor, he took a great deal of pride in his professional ability as a pilot, and his knowledge of the aircraft.

The "after takeoff-climb" checklist was inter-

rupted by the copilot when he reported the right main gear was not indicating up and locked. This was confirmed by the flight mechanic after a visual inspection. The right gear had not fully retracted into the wheelwell, but no apparent damage was done to the fairing doors or the tire.

Having checked the hydraulic pressure gages for normal pressure and satisfied he was confronted with only a single malfunction, the AC instructed the copilot to lower the gear. All gear locked in the down position.

The tech manual contains a warning not to recycle the landing gear when an up and locked malfunction occurs. An unknown mechanical defect could exist which might cause the gear to jam in the up position.

The AC was well aware of this warning and even briefed the crew of its existence. However, he also remembered running into a similar situation when the gear did not fully retract and a wrench, discovered in the wheelwell, had been the cause of the malfunction. The possibility of the same situation existing here was too much to resist. The fact the gear could jam in the up position had all but been erased from his mind. If he was right and the gear went to the up and locked position, he could continue the mission and there would be no delay. If it didn't lock in the up position, he would simply put it back down and land for repairs. The "overconfidence syndrome" had struck again.

Fortunately, after the AC recycled the gear, he was able to put it back down. It locked, and he landed without further incident. But it could just as easily have been a major aircraft accident, killed 20 passengers plus the crew, and resulted in the loss of an aircraft.

Why, then, does an AC and others like him, with their vast experience, knowingly violate a tech manual warning? There are two sentences in the front of every tech manual that state: "This manual provides the best possible operating instructions under most circumstances, but it is a poor substitute for sound judgment. Multiple emergencies, adverse weather, terrain, or extenuating circumstances may require modification of any procedure(s) presented in this manual." Contrary to popular belief, this is not a license to violate the tech manual but a reminder to temper all known knowledge with good common sense in unusual situations. Sound judgment is an absolute necessity. However, as we gain more experience as a pilot, more experience and knowledge of an aircraft system, aircraft become so reliable that malfunctions rarely occur, and there is a tendency to build overconfidence in ourselves and our aircraft. When this happens we are vulnerable to attack by the "Overconfidence Syndrome" and aircraft operating instructions coupled with good common sense are no longer the basis of sound judgment.

What is your present situation? Can you see yourself slowly approaching this type of pitfall? Remember, the effects of the "overconfidence syndrome" can be potentially dangerous. I know — but I was lucky — I was the experienced aircraft commander with the gear malfunction.

Overconfident

Global Notes

award winner at Dover AFB

SSgt Frederick J. Chiu 436th OMS, Dover AFB, Delaware, has been awarded the MAC Distinguished Individual Safety Award for preventing what might have been a major aircraft ground accident. Departing a C-5 aircraft which he had just refueled, Sergeant Chiu noticed smoke pouring from a van parked next to the aircraft. Sergeant Chiu pulled a portable CB fire extinguisher into position next to the burning van, entered the vehicle, and began extinguishing the fire.

A burning vehicle located in such close proximity to the aircraft produced an extremely hazardous condition due to fuel fumes venting overboard from recently refilled wing tanks.

When fire-fighting men and equipment arrived, Sergeant Chiu had the vehicle fire under control. Sergeant Chiu's quick thinking and decisive action prevented the destruction of the vehicle and possible damage or destruction of a C-5 aircraft.

life support man of the year

The Life Support Man of the Year for 1973 in MAC is A1C William Welcome, Headquarters Squadron Section, 62 MAW, McChord AFB.

In the February issue, THE MAC FLYER erroneously listed A1C Joe Cammarano, 436 MAW, Dover AFB, as recipient of this award. Airman Cammarano was chosen as one of the outstanding MAC life support personnel and was one of those nominated for the top award.

We regret the error and offer sincere congratulations to Airman Welcome for his outstanding achievement.

PJ's convene

Pararescuemen from ARRS units throughout MAC met at Scott AFB recently to discuss current pararescue procedures and the latest helicopter rescue eqiupment. PJ's have saved hundreds of downed pilots in combat and frequently demonstrate the inclination to accept challenges at the expense of their own self-interest.

76 ARRS winners

TSgt Hillabrandt, left, and TSgt Roby, right.

TSgts James L. Hillabrandt and David R. Roby, 76 ARRS, have received MAC Distinguished Individual Safety Awards for their outstanding performance during a ground emergency. While loading pyrotechnics aboard an HC-130, both men heard a "pop" and saw wisps of smoke coming from a MK-25 flare. The closing plug had ejected and one side was hot. The two men moved the flare away from the aircraft and notified EOD. Examination of the flare by EOD revealed that an arming squib had fired prematurely.

The MAC AIREP — Who Needs It?

Reports from aircrews are still the primary tool for global wind forecasts.

by Capt Al Zak, MAC/DOW

Sitting in the cockpit at cruise altitude and suffering the HF communications malady caused by poor atmospheric conditions, many pilots have spat curses at the prospect of transmitting the next AIREP. It's tough calling off all those numbers to the airways station — and then having to repeat. Besides, how could one report possibly be so important? Who needs it?

Just as in our elections, when we strive to have as many citizens as possible express their views, we also need maximum AIREP input in order to obtain accurate weather data for trips across the pond. So cast my vote for the AIREP — it provides the inflight information so vital to the weather data system. I know, because I am a weather forecaster.

The AIREP also contains the aircraft position report for air traffic control use and command flight following. However, this article addresses only the weather portion of the AIREP.

You, as an aircrew member, aren't benefited immediately by your own AIREP's, but the crew flying behind you is; and you also benefit from the reports of aircraft ahead of you. But exactly how does the weather information get from AIREP to pilot for flight planning?

Into the Computer

When airways stations copy your messages, they transmit the weather data to the Air Weather Service Automated Weather Network at Carswell AFB, Texas. The data enters a giant high speed computer for distribution. Within minutes, overseas departure bases receive your AIREP information for use at crew briefings. The AIREP information is also transmitted to the Air Force Global Weather Central, Offutt AFB, Nebraska. There it's immediately plotted on the upper air charts and compared with other data for updating the computer flight plans. If discrepancies are detected, the forecast wind data base is revised to reflect the latest reported winds. Even if there are no significant changes generated by the AIREP, the computer flight plans are updated, using your AIREP's and inputs from other sources every 12 hours.

The computer system also supplies AIREP data to the Navy's Fleet Numerical Weather Central at Monterey, California, and the National Meteorological Center, Suitland, Maryland. So if you file out of a Naval Air Station or a

large civilian airport, you'll still reap benefits from the MAC AIREP system.

Command Post Monitors

The numbered air force command posts use the AIREP as they mission follow your aircraft. A weather man in these command posts plots the data and studies changes on the weather board to spot potential dangers. If winds ahead of you change rapidly from that forecast, you'll be warned before you've exhausted your fuel reserves.

SAC, TAC, and some civilian pilots transmit AIREP's also, and they receive the same benefits from them as MAC crews. Unfortunately, not all civilian carriers use reporting symbols compatible with the computer, so inputs aren't received from every aircraft flying over your route. However, there are enough Air Force and civilian crews in the reporting system to provide adequate weather data on most MAC routes.

Figure 1 shows a large portion of the Pacific Ocean with no AIREP's plotted. Contrast this

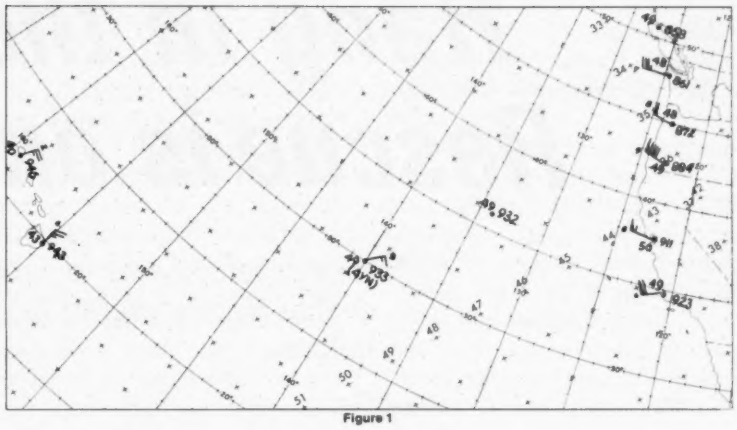


Figure 1

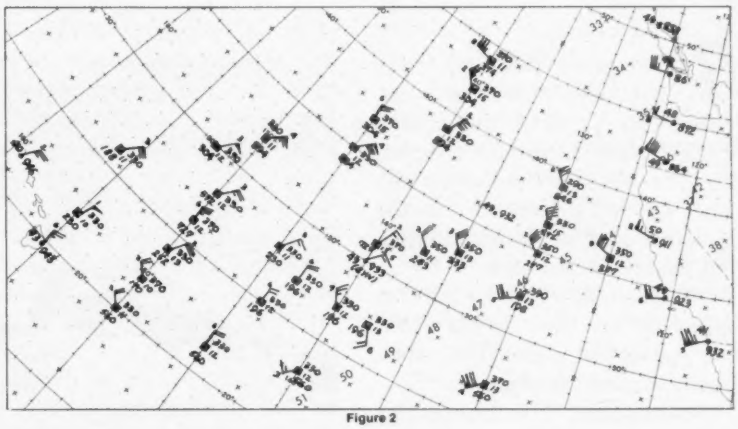


Figure 2

with figure 2 on which is plotted multiple weather reports, and it's easy to see that forecasts are obviously more accurate when the AIREP's are plotted.

Consider the diverse weather conditions throughout the world — and the normal difficulties caused by forecasting without accurate information — and it's easy to see that the weather forecaster needs your AIREP. Since you're the one who'll bear the brunt of a faulty forecast, you need the AIREP as much as anyone. Remember, with fewer flights nowadays, there are fewer AIREP's transmitted — so, each one is needed more.

What's in the future for you and the AIREP? One day you'll transmit it directly to command posts and weather stations via satellite. The data will enter the MAC Integrated Management System (MACIMS) data base and be used in automated mission following programs to monitor your enroute progress.

Until then, I'll be standing by for your next AIREP and looking forward to briefing you on your next trip.

Hang in there Baby, Rescue is on the Way

New developments in survival detection equipment will enable rescue aircraft to zero in on survivors like never before.

by Maj Clarence C. Campbell, ARRS/DOQ

"Both engines just quit," the pilot yelled over the interphone. He jammed the control stick forward to keep the airspeed up. The nose of the fighter aircraft pitched downward and the altimeter needle started unwinding hastily toward zero.

"Engine restart checklist," he yelled as his eyes darted about the instrument panel. His hands busily flipped switches.

No response. The silence was deafening! The rush of the wind against the Phantom's canopy and the sound of labored breathing mirrored the fears of the two occupants.

"If she doesn't start before we hit 2,000 feet, we'd better leave it," the pilot told his backseater. The engines still didn't respond.

"There's 2,000 feet, let's get out of this crate! I'm squawking emergency and have already armed the DIL. See you on the ground."

As the canopy ejected, a small package was also ejected from a compartment in the tail section.

Within seconds, this small electronic device had transmitted the aircraft identification and exact location of the incident to the nearest Rescue Coordination Center. Soon, a rescue helicopter was on its way.

Sound like something out of a Buck Rogers novel? Maybe so, but what I've described could become a reality within a few years. It's all part of a government study to provide a world-wide capability to promptly detect and locate air disasters. It's called ASAP. That doesn't stand for "as soon as possible." It's actually an acronym for "Advanced Survival Avionics Program." The need for such a program is justified when one considers the thousands of manhours and flying hours expended each year searching for and aiding personnel in distress. At present our entire flight planning and mission following program is based on the probability of an in-flight incident, and is designed to narrow the search to the area which offers the greatest probability of success.

Consider the following: Recently, ARRS forces were involved in a massive search for a missing aircraft. The aircraft departed on a three and one-half hour VFR flight plan with six hours of fuel on board. When the aircraft failed to reach its destination, massive efforts were initiated to locate it. The primary search area, the one which offered the greatest chance of success, encompassed 34,000 square miles. The secondary search area encompassed an additional 53,000 square miles. Additionally, 30 to 40 aircraft were available each day for the search. Before the mission was suspended, 39 days later, it was estimated that an accumulative area of 325,755 square miles had been searched and 1,033 sorties and 3,602 hours flown. It was further estimated that had the lost aircraft been equipped with an electronic location device, the probability of detecting its signal would have been 99 percent. How much time could be saved if the exact location of a crash were known? How many lives could be saved if rescue forces could pinpoint the exact location of each survivor? ASAP is designed to provide just that capability!

The ASAP system is still in its infant stage of development, and although several problems must still be overcome, the basic concept could revolutionize SAR tasks.

Basically, here is how the system works: ASAP components fall into two groups, the Distress Incident Locator (DIL) Group and the Survivor Locator Group (SLG). The DIL is an electronics package mounted on the aircraft. It can be deployed automatically or manually, depending on the urgency of the situation. This sounds like nothing more than our current crash position indicator (CPI) systems. But it's much more. Once deployed, the DIL is capable of receiving OMEGA long range navigation signals. It codes these signals into a position report containing the latitude and longitude of the crash site, and adds the aircraft identification. The device then transmits this information to a satellite which, in turn, amplifies the information and transmits it to a Search and Rescue (SAR) Center. Upon receipt, the SAR center dispatches a rescue vehicle from the unit nearest to the incident site. Sounds fantastic, right? Wait a minute! The best is yet to come.

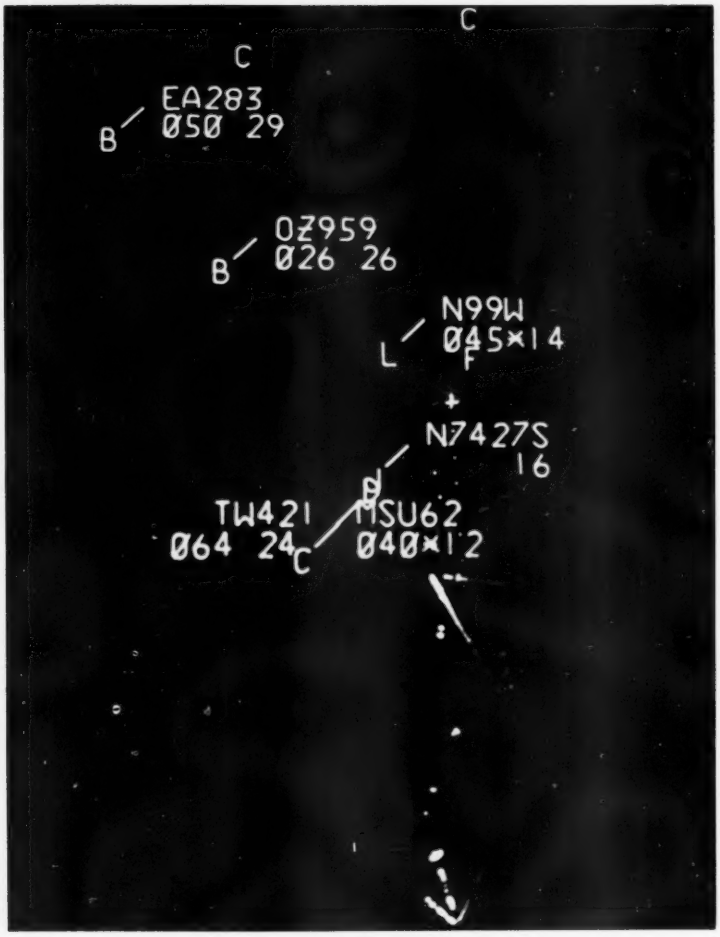
The second group of components is called the Survivor Locator Group (SLG). These devices enable the rescue vehicle to locate each survivor. As the rescue vehicle nears the crash site, an operator activates the SLG. It immediately tells him the relative bearing of each survivor. Pressing another button, the operator is also given the distance to any one of the survivors he selects. This information is made possible by small hand-held beacons carried by occupants of the incident aircraft. The equipment in the rescue vehicle simply challenges the beacons and interprets their reply. Once this information is received, the rescue aircraft can go about its task of recovering personnel or dropping pararescuemen to administer medical aid until recovery is made.

With programs such as ASAP on the drawing boards, the job of Rescue should be made a lot easier and "That Others May Live" will become more and more a reality. Additionally, millions of dollars and thousands of manhours will be saved and redirected toward other lifesaving tasks. The future will look much brighter for those unfortunate enough to be involved in air crashes in remote parts of the world. And if future developments proceed as planned, these future crash survivors can rest assured that rescue and medical attention is not far away — in fact, it will be there — ASAP.

"Squawk Mode

Here's one transmission that crews will hear more frequently as new air traffic control equipment cranks up.

by Capt A. R. Barbin, Associate Editor



Alphanumeric codes indicate call sign, altitude, and calculated ground speed.

Pilots making their way through certain selected airspace in the United States will probably find their journey much quieter — and safer — after July 2.

That's when some 60 terminal traffic control facilities officially crank up new flight monitoring equipment and some of the more complex Terminal Control facilities assume their roles under the Group 1, Terminal Control Areas (TCA) system.

If that aeronautical title doesn't turn you on, the implications of the new system should certainly spark a great deal of interest in fliers who will transit these areas once the system goes into effect.

Expedites Flow

The object of the system is to expedite traffic flow in certain high density areas and thereby provide safer and more efficient air traffic operations. To accomplish this, an FAA regulation requires that, in certain designated flight areas, aircraft must be equipped with altitude reporting transponders compatible with ATC center equipment. Operating as a unit, this equipment causes a display of alphanumeric data

Charlie"

on center radar scopes which includes the aircraft's identity, actual barometric altitude and, on some equipment, calculated ground speed.

Reducing Chatter

It isn't difficult to imagine some of the safety benefits inherent in such a system. But what most pilots probably will notice first is a reduction in frequency chatter as the controller reads vital information right off the scope, reducing the need for much of the conversation between aircrews and the controlling agency.

Group I is only part of the system, which is being implemented in stages. Group II and Group III Terminal Control Areas will require four digit and altitude reporting transponders in 1975.

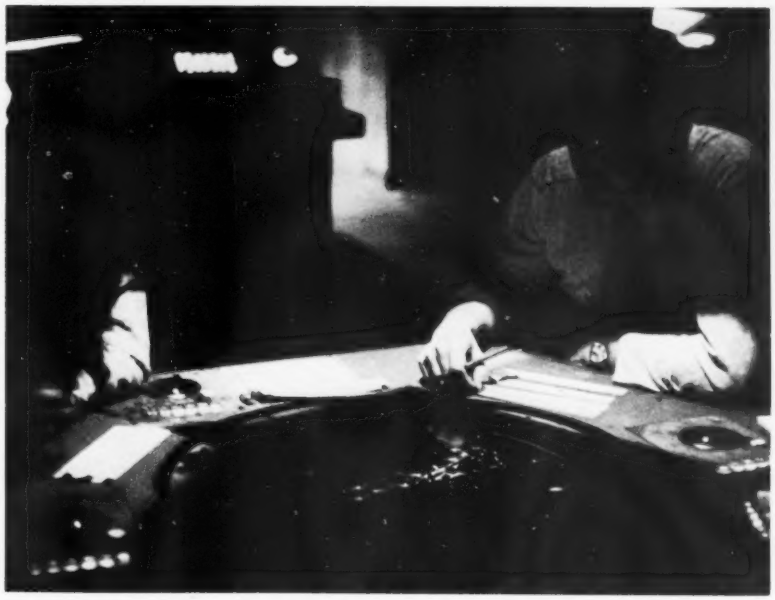
Group I TCA's are areas with the highest density of air traffic. They are located in New York, Washington, D.C., Miami, Los Angeles, Atlanta, Chicago, and Dallas-Fort Worth. Group II TCA's are areas of fewer air operations. Thus, operational procedures are less stringent than those for Group I. Group II includes Boston, St. Louis, San Francisco, and Seattle. Group III TCA's have not yet been designated. After 1 July 1975, all controlled airspace in the 48 continental United States and the District of Columbia (above 12,500 feet MSL, excluding airspace at and below 2,500 feet AGL) will be included in the new system.

Most MAC aircraft are already equipped with automatic altitude reporting capability. Some aircraft and helicopters in the MAC fleet are undergoing retrofitting. All this sounds pretty good but pilots will still have to keep an eye out for VFR traffic (light airplanes) in terminal areas.

Groups I and II TCA's are not restricted to IFR traffic. VFR flights arriving and departing airports other than the primary airport (i.e., the airport for which the TCA is designated) may obtain clearance to transit the Control Area if IFR traffic permits. A private plane on VFR or IFR flight into a Group I primary airport must be equipped with a 4096 Transponder, a VOR or tacan receiver, and a communication radio. The transponder is required only for flights into the TCA primary airport. VFR traffic will be separated from IFR traffic per Stage III TRSA procedures (See FLIP, Pilot Procedures in Section II).

Benefits of New Equipment

Aircraft will leave their unique signatures (alphanumeric) on radar scopes from the instant they enter the radar surveillance area. An alphanumeric signature consits of aircraft identity or beacon code adjacent to the target position symbol. Altitude and calculated ground speed codes appear next to target symbols wherever automatic tracking is provided. Radar controllers will be



Controller vectoring an arriving jetliner.

"SQUAWK MODE CHARLIE" — continued

able to quickly reference relative distances, altitudes, and azimuth between aircraft in their radar sectors.

Pilot workload and cockpit interruptions will be reduced since fewer altitude and position reports will be necessary. This feature will enable pilots to devote more attention to other cockpit duties.

Communication congestion is already on the decline in many high density areas. Application of advanced technology into highly sophisticated air traffic control equipment has lessened altitude and identification transmissions between pilots and controllers. Communication frequencies will open up even further for essential communications such as clearances, emergencies, and radar vectoring.

But even if aircraft communication radios fail, a pilot can still "transmit" essential position and altitude data to center or approach control through its transponder system.

The new equipment will give controllers greater vectoring flexibility than they now possess, and pilots can expect more direct routing than they now experience.

FAA studies conclude that altitude displays in the new system correspond with cockpit indications 99.6 percent of the time. Such reliability greatly reduces chances of human error.

FAA's intention to require altitude reporting equipment for high density terminal areas and the upper segments of controlled airspace dates back to 1965. The agency has conducted conferences with general aviation and the aerospace industry to design effective policies and to develop and standardize ground and airborne altitude reporting equipment.

The initial implementation of such a system in July indicates that the time is fast approaching when all aircraft will be required to signal position and altitude automatically for the sake of safety and efficiency.

The added altitude dimension allows controllers more time to concentrate on air traffic separation.

REFERENCE

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Planning Data and Procedures, Section II, DOD (3 Jan 1974).

Capt Maurice L. Martin, pilot.

1st Lt Michael D. Archer, copilot.

GOOD SHOW

Capt Maurice L. Martin, Jr., and his copilot, 1st Lt Michael D. Archer, Det 4, 39th Aerospace Rescue and Recovery Wing, Thule Air Base, Greenland, were returning to home station from a routine Arctic support mission and were preparing their HH-3E for a precision night recovery. The helicopter began its approach and the three-man crew and fourteen passengers were only seconds from touchdown when, approaching decision height, Captain Martin increased collective pitch to cushion the landing. The rate of descent decreased as expected but, suddenly, the big chopper began to yaw wildly to the right. Full left rudder had no effect, and Captain Martin directed Lieutenant Archer to shut down the twin gas turbine engines upon his command.

To halt the helicopter's clockwise rotation and prevent an out-of-control landing, Captain Martin simultaneously decreased collective pitch to minimum and directed Lieutenant Archer to shut off the speed selectors. In spite of darkness and the blowing snow, Captain Martin settled the HH-3E safely onto the runway. There were no injuries and no aircraft damage.

Investigators found that the uncontrollable yaw was caused by a broken tail rotor control cable. The cable had been misrouted over a pulley guide pin during maintenance. This had caused cable stress fatigue and subsequent failure.

Loss of tail rotor control in any helicopter, particularly during the approach or landing phase, is a serious malfunction requiring prompt recognition, analysis, and corrective actions. Captain Martin and Lieutenant Archer, working as a team, responded in the most professional manner during this difficult control malfunction.

THE MAC FLYER takes pride in joining the rest of the Military Airlift Command in saying, Good Show!

What's Up, Doc?

For years you've been visiting the Flight Surgeon's office for your annual physical, routine in that you know just what to expect and never get any big surprises.

But this time, instead of the same old routine, at some point during your physical the medic ushers you into a small room, tells you to take off your shirt, and very methodically begins attaching sticky little wires to your arms, legs, and chest.

What is going on? The most probable explanation is that you've turned 35, a point at which you reach a new medical plateau in your flying career.

Those little wires are part of the electrocardiogram equipment with which you will become more familiar after reaching this ripe old age. As the years roll by you will be introduced to even more specialized equipment, all designed to keep you in sharp physical condition by detecting defects early enough to do something about them.

A Ripe Old Age

It all starts at 35 with the electrocardiogram because statistics show this is the age at which a significant amount of heart disease can be discovered in its early stage. Frightening? Not necessarily, because early detection of the disease does not mean that you're going to keel over with a heart attack at any minute. In fact, it greatly reduces the odds of this happening.

When a person reaches 35, it's time to start looking for changes in the functions of his heart in order to avert, or lessen, the consequences of heart disease. The EKG is a diagnostic tool which allows detection of progressive heart changes or abnormalities before they cause problems.

Once you reach 39 and have just about reconciled yourself to growing old and the inevitability of the annual EKG, you'll find that it's time for a few more "extras." One of the more interesting

Flight physicals become more critical when fliers reach the ripe old age of 35.

by Capt Ronald B. Green, USAF MC
Scott AFB Medical Center

of these is called the pulmonary function test (PFT).

The PFT is a means of detecting lung diseases, particularly emphysema, before they become severe enough to cause illness. A person may actually have a lung disease without feeling ill. This is because his body compensates for the decreased ability of the lung to function. Once the body has reached its limit of adaptability, however, the patient begins to feel ill — and he is.

Exhale — Inhale

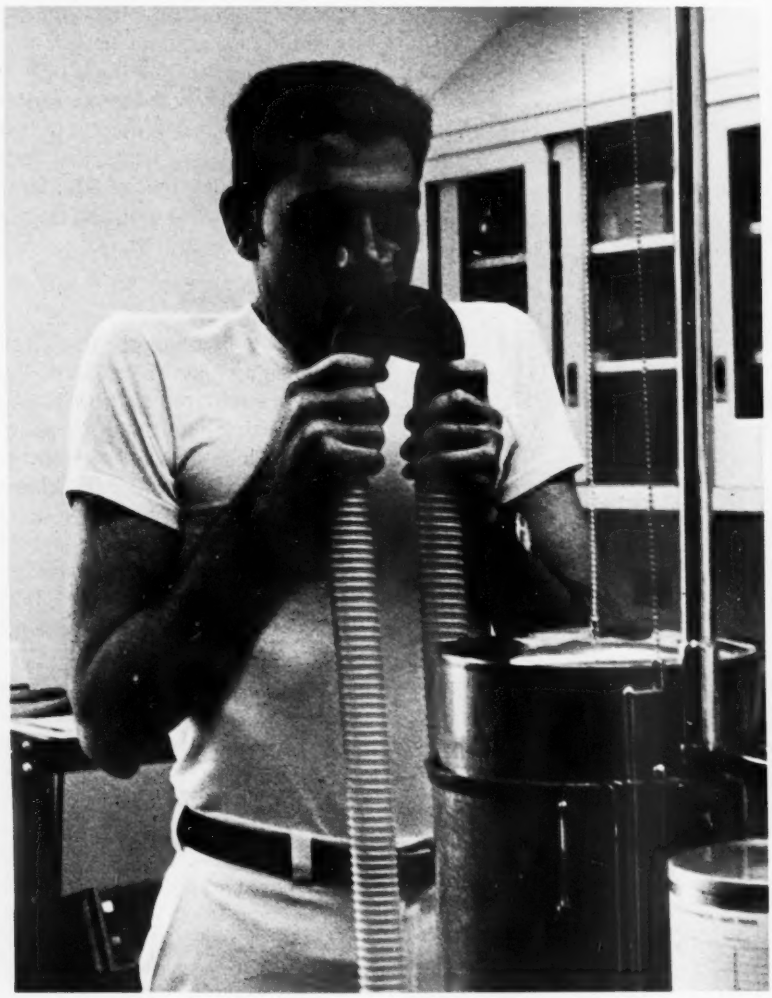
Once you undergo this test, you aren't likely to forget it. Patients are required to blow in and out of a machine called a spirometer. This gadget, which is enough to arrest the enthusiasm of the most incorrigible loud mouth, measures the amount of air a person can exhale and inhale. If the examinee can't huff and puff up to snuff, he might have a lung problem.

Even healthy lungs are often pushed to their limits during this test. Some people just don't have a lot of air pressure to begin with. But "they" have ways to remedy this. A strong voiced aeromedical technician usually stands ready and barks out demands in a cadence that prompts the strongest efforts from even our most senior officers.

These exultant commands may seem like harassment but it's really just the technician's way

of helping you pass the test. It is only incidental that most of them seem to enjoy their work more if the examinee happens to be an officer.

Another instrument brought to bear on the over 39 gang is a fragile gadget called a tonometer. This Lilliputian-like instrument measures eye pressure, searching for signs of glaucoma, a disease of the eye's fluid system. Glaucoma can cause blindness. Increased pressure on the eye is an indication of this disease. Whenever the amount of this fluid increases or its release is blocked, the pressure builds up. If this condition isn't detected soon enough, it will cause progressive blindness. However, glaucoma is a treatable disorder. The use of certain drugs changes the fluid dynamics and lowers the pressure.



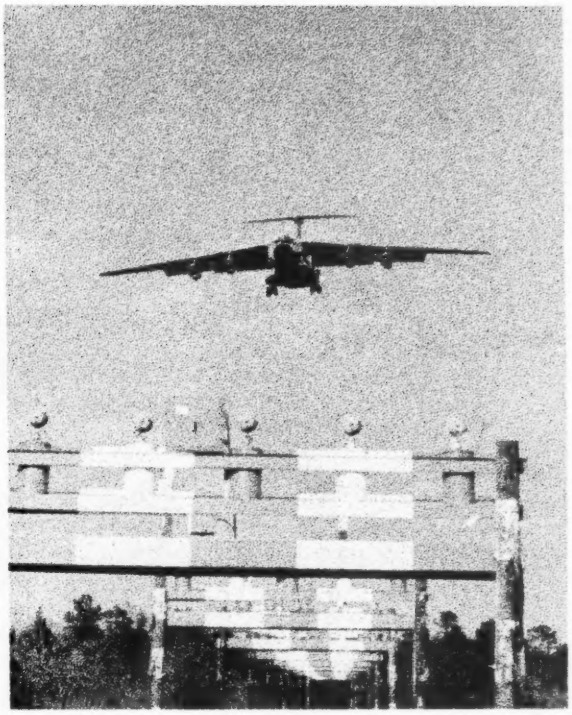
The Pulmonary Function Test — good preventive medicine.

Shockingly Sweet

At an age when most aircrew members like to limit "sweets" to an after dinner cordial, another "old age" requirement, the glucose tolerance test, comes as somewhat of a shock. This gastronomical trial requires that you drink a sickening sweet, soda-like substance and then have your arm jabbed for blood samples during the next three hours. If this seems somewhat unpleasant, its purpose certainly makes it worthwhile. The test is designed to detect a tendency toward diabetes, another treatable disease. Diabetes may occur in adults who have never before shown dispensation toward it. So, once you're 39 —.

These are only some of the examinations to which you will be introduced on future flight physicals. As medical technology continues advancing, the numbers of such tests will doubtlessly increase. But they're all designed to detect potential problems before they can develop into big trouble for the many aircrew members and support personnel who help keep the Air Force flying.

Crash and Dash



Once upon a misty night,
When runway 21 was barely in sight.
A lone Starlifter threaded its way,
Somewhere out near Frisco Bay.

The bird passed right over the VOR,
Inbound on final — now VFR.
Descending slowly into the night,
The copilot called, "Runway in sight."

The aircraft entered a thin kind of mist,
That the pilot had thought he would certainly miss.
But just as he readied himself to land,
The runway approach lights upset his plan.

The pilot's visual cues were all but spent,
But down below MDA the big bird went.
Lower and lower, with no sight of ground,
The AC decided to take it around.

But as the young skipper started the go,
It came to him suddenly — he was too low!
The Starlifter sank down into the lights,
All knew by the sound — they had dinged it, all right.

The power took hold and the Starlifter climbed,
Now to pattern height — for just one more time.
This time a precision approach was flown,
To touchdown where two of the plane's tires were blown.

If the runway you want gets lost in the weather,
Or the approach that you're making could be a lot better.
Don't sit there just hoping you'll soon see the ground.
Don't rush, but don't wait. Take the damned thing around.

Have a seat Sammy m'boy. We don't want the wrench-turners on the flight line to get the idea we're eager. They'll think we want to take the helicopter before they check all the sumps."

The Rotund One settled back into a snack bar chair and returned to his third mini pizza, his pudgy paws testifying to his weakness for such fixings.

"Where're we going today, Sir?" asked Long Suffering Sam, the aspiring rotorhead. "I need a lot of flying time before I'm eligible for AC."

"We'll be ahhhh — (gasp, smack, swallow) — journeying up to the mountains today to recce some fishing streams and Alpine lakes. The winter's white has gone, leaving our recreational spots full of cool water and fighting trout. Tassles and I are going to slip up to Lake Steelhead this weekend. Can see it now — pitch a tent, draw in a mess of fish, and then enjoy the pleasures of outdoor living, with charcoal smells, frying pan delights, and good company. Ahh, for the fresh air in the mountains."

It was obvious that, given the opportunity, the Master of Cyclics would carry on for hours. But Sam stoppped him. "Sir, would you like me to complete the TOLD card? If we're going to high altitude, we — "

"Naw. We'll give a quick power check on-the-go. If we get plenty of torque down here where it's hot, we'll be able to do anything we want up there in the hills where it's cool."

Sam had flown with an IP the day before and that seasoned pilot had expounded on the importance of proper flight planning. At this time of year the towering hills were steamy with convective currents which could prove an unpleasant surprise for any unsuspecting rotor winger.

The Aviator with Avoirdupois started rambling in a different vein, now. "I remember the first eggbeater I ever flew. We didn't know what performance charts were. I think it was the cylinder head temp we watched — yeah, that was the key. If we could keep the cylinder head temperature where we wanted it, we knew we would have the power we needed. Worked every time."

"But sir, we're flying a turbine powered machine," reminded the younger pilot. "We've got more power than you ever had then, but we also have more weight to lift. Besides, we'll be climbing higher than you were used to. I'd better see what the performance charts say."

"No time m'lad." A final backhand swipe across his mouth left traces of tomato sauce on C.R.'s bristly upper lip. "We must be off to base ops to order coffee and

water and announce that we're going to borrow a rotor machine for a couple of hours. Don't want the sky cops to think we're taking an aircraft without authorization. They get a little touchy about that sort of thing."

A crew bus, waiting at the back of the building, took them to the ramp side of base operations where they saw a beehive of activity around their assigned helicopter. Refueling was in progress.

"Wonder if they're having problems getting the bird ready this morning?" asked the concerned copilot.

"Oh, they're probably just holding class for some new three-levels," responded C. R. as the duo bounced toward ops. "Pilots really have to be alert nowadays with all the new guys just out of tech school. Never know when some young troop will forget to perform a check and we have to burden ourselves with the task of identifying a faulty system."

After placing a fleet service order and filing a flight plan, the pilots started for the exit.

"Sir, aren't you going to stop by weather? It's pretty windy and we'll need the temperature for our takeoff daaaa — "

"Sammy, you must trust the master. It's victor fox romeo outside. The important thing is how the chopper feels and sounds, not what some engineer's figures try to say. Anyway, we're on a training mission so we'll be plenty light. Hey, the crew bus is awaiting."

The HH-3E engines overtempted slightly as the copilot practiced his starting procedures. The outside air temperature gage showed a plus 35 degrees centigrade.

"Wow. It's over 90 degrees," remarked Sam. "We might have a problem getting up to Steelhead today. What's its elevation?"

"A mere 9,300 feet. Adiabatic cooling will thicken the air for our high altitude recon mission. Standby to go!"

The World's Greatest moved the chopper forward, rapidly pulling in collective and, just as quickly, reducing it back to takeoff setting. "See, we have enough power to lift Jumbo the Elephant. You worry too much, Sam. You must develop confidence and hold your cool if you expect to upgrade."

The young left seater studied the torque meters, but the check was performed so rapidly he couldn't record the amount of power available. He was hesitant to dispute the boss' shoddy power check, but it seemed as if the engines had shown far less than normal power.

* * *

"Wheeee. Let's strafe the face of that cliff." The helicopter shuddered as its blades clawed at gusts from a palisade. "See m'boy, we're already at 8,500 feet and I can maneuver like we were at sea level. Whooops — heh, heh, — a little bumpy up here. Let's break it off and see who's at Steelhead."

The Jolly Green staggered toward a higher altitude. The engines hungered for cooling air as the T5 temperature gages neared redline in the thin air.

The aircraft commander's heart pumped rapidly with excitement as he prepared for a low level run along a feeder stream toward Lake Steelhead. He eased the cyclic forward and started to descend.

"Hold on — and away we goooooo!" commanded the mustached Flier of Fling Wings. "We'll simulate looking for a downed fighter pilot to keep this little diversion all legal-like."

"Sir, we're not supposed to go this low. This isn't one of our training areas," answered the harried copilot, his heart pounding with fear.

But on they went — 120 knots, 130 knots! The airspeed exceeded red line and continued to increase. C. R. gummed his ebony cigarette holder, taking long draws from an Egyptian Oval. As his confidence increased his caution disappeared. But the rotor blades could not overcome the forces of gravity, thin air, turbulence, and high speed. The Fearless Leader neared the end of his run and the stalling blades emitted a staccato of rattles and vibrations.

"Cheez, Sammy! We're losing control — "

The Master Manipulator of Flying Things strained to regain control of the descending helicopter, but the retreating blades were too overtaxed to give the proper response.

C.R. TERROR — continued

"A mechanical failure, a catastrophic occurrence, an act of God!" wailed the startled pilot. Pools of perspiration formed between his shiny dome and the leather insert of his hard hat. The helicopter was rolling slowly to the left and descending toward the rocks below. Suddenly, the lake appeared in front of the aircraft. The AC's muscles stiffened as the rocks and water rose up to meet him. His tense arms straightened, and in doing so accidentally lowered the collective — a Dash One procedure for blade stall. The airspeed slowed and the helicopter began to level off, just above the rocks.

C.R. remained frozen at the controls. The machine continued flying without pilot inputs, a classic case, fortunately, of the aircraft flying the man.

Sam silently remembered a similar situation in which he was on a roller coaster at the Spring Lake Amusement Park in Oklahoma City. But there, the tracks provided guidance. Here, gravity and inertia seemed to be conspirators in the downward plunge.

"Sir, Steelhead is below us now. Maybe you should set her down there — if you can!"

"Gear down!" yelled the tense pilot. His copilot's voice had brought him out of the trance.

"If we're going to land on the water, shouldn't we keep the gear up?" asked the amazed leftseater.

"Harrumph, quite right m'boy. Just testing to see if you had lost your senses during my emergency descent demonstration."

The Sweaty One set up an approach to the water. He increased the collective to slow the rapid descent for touchdown, but the chopper continued settling in the thin air.

"I'm going to take it around," squeaked the rotund frame in the pilot's seat. "We're going down a little fast."

But the overloaded pilot discovered that the descent could not be arrested. The helicopter hit the water with terrific force, ripping open the lower fuselage.

"Wow! Those maintenance men must have messed this bird up good. If I hadn't been on top of the situation, we might have had some real serious problems," the helmsman retorted.

Long Suffering Sam had long since learned not to contradict his superior, but he thought that the boss' problems were probably just beginning.

Soon after the pilots had made an emergency call to another helicopter, C. R. detected a sinking sensation which could mean only one thing. The lower underbelly had taken on too much water and the floundering machine began to sink toward the very fish which C. R. had planned to catch over the weekend.

* * *

"Major Terror, you have destroyed a valuable aerospace vehicle — one which we need dearly for our training program." The commander was unsympathetic. "You realize, of course, that you're grounded. Your performance data should have told you to stay away from that high altitude approach. Had you read your maintenance form, you would have discovered that your tip tanks were loaded with fuel for an extended training period. You would have known that you were heavier than normal today. Do you have anything to say concerning your gross negligence?"

"Why sir, ahh no sir. We ahh — "

"We'll be seeing you again Major as the investigation continues. Dismissed!"

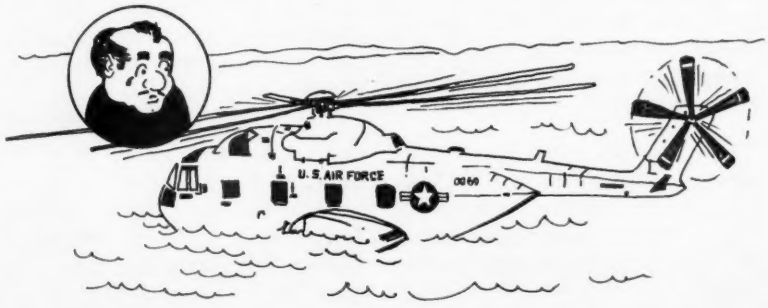
"Yes sir," whispered the former aviation giant. He whirled and walked into the corridor where his copilot awaited.

"What did he have to say sir?"

"Oh, the usual rot. No big deal. He obviously recognized that had it not been for my superior airmanship, there probably would have been loss of life."

The puzzled assistant thought for a moment then smiled and paraphrased an old saying he had heard.

"Well sir, it's like they say, I've never seen a landing yet that was bad — if you could swim away from it."



Solving an Equation—the Hard Way

$$\frac{(\text{Assumptions}) + (\text{Aircraft})}{\text{People}} = \text{Error}$$

by Capt C. A. Lagroix, Canadian Forces

A senior flight engineer on a flight which was scheduled to refuel at a USAF base after a very enjoyable and expensive stay south of the Canadian border learned the essence of the above equation the hard way. Yes, the trip had been to one of the more exciting places in the world. The crew prepared the aircraft for a long flight home and, since the oxygen system required replenishing, ordered the oxygen cart through Base Ops.

When the oxygen cart arrived it was the standard storage bottle type with a self-contained pressure gauge. It was connected to the aircraft oxygen replenishment system and the valve was opened. There was no delivery. The gauge on the oxygen cart indicated 2500 psi and the aircraft gauge read 600 psi. There was no drop on the cart gauge to indicate delivery nor was any rise noted on the aircraft system gauge. The oxygen simply wasn't flowing. The servicing technician who had delivered the cart informed my friend, "Sarge, you sure got trouble with your airplane."

By this time the rest of the crew had arrived and when told of the situation, volunteered to help. Engineering orders were consulted and the aircraft oxygen system was checked. The crew members made suggestions: the non-return valve on the delivery line was stuck closed; there was a restriction in the line and so on. All were checked and all proved to be incorrect solutions. This, of course, took time and the aircraft captain, faced with a long flight home and the responsibility of remaining within the crew time limitations, declared a 24 hour delay. Messages were sent. The reason for the delay was an unserviceable aircraft oxygen system.

Meanwhile, the line servicing crew had changed shifts and the shift NCO was a grizzled master sergeant who had been around for a long time. He arrived at the aircraft and asked what the trouble was. When informed, he asked if another cart had been tried. It hadn't. With that, he walked over to the delivery cart and rapped the gauge with his clipboard. The needle fell to zero — the cart was empty. Small wonder there wasn't any delivery — there wasn't anything to deliver. The gauge had been stuck at 2,500. Another cart was obtained and the system replenished. The master sergeant then passed on to my friend extra advice, "Son, you never assume anything around an aircraft — you always check and double check everything."

Humorous? Ridiculous? Unprofessional? Perhaps, when the incident is viewed with the advantage of hindsight. Yet all the people involved were very experienced. What had happened? Did the cart attendant plant the first seed with his statement "You sure got trouble with your airplane." Certainly everyone involved assumed that the cart contained 2,500 psi — until a master sergeant arrived who had learned not to assume anything.

Check, then double check — that's the solution to this type of an equation.

— FLIGHT COMMENT

QUICK STOPPERS

False Alarms

Most pilots are aware of problems caused by a false alarm on IFF/SIF code 3100, and there is generally a great deal of care taken not to linger on that code when selecting an ATC code assignment.

What is not so widely known is that all codes in the block 3100-3177 will sound alarms at centers equipped to automatically recognize the alert. Switching procedures aimed at avoiding momentary alerts on 3100 (or 7700) should be confined to the first two digits.

For example, if you are squawking 2100 and ATC assigns 4224, select the second digit first. Selecting the last two digits first would be no safeguard against ringing the bells when you went through 31 on the first two digits.

— BOAC AIR SAFETY REVIEW

Bled Brakes

During an engine run, the maintenance man advanced the throttles of a C-130A into the flight idle range and the aircraft suddenly rolled forward. The mechanic who was in the copilot's seat depressed the toe brakes, hoping to stop the machine. Instead, he only released the parking brakes. The toe brakes wouldn't stop the aircraft as it jumped the chocks and continued to roll.

The maintenance supervisor, in the pilot's seat, stopped the aircraft with reverse thrust.

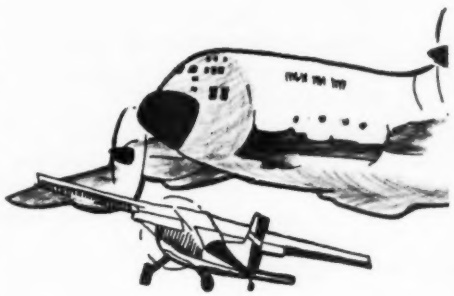
Why was there no hydraulic pressure in the brake system? Maintenance personnel in the cockpit used the engine runup checklists correctly until the point of shutting down the gas turbine compressor. At this point, the maintenance supervisor, without realizing it, also shut down the air turbine motor (ATM). This removed the source of hydraulic pressure for the emergency brakes. Since the normal brakes had not been selected, and the source of emergency hydraulic pressure had been shut down, the pressure quickly bled off.

The supervisor did not remember why he shut down the ATM and its vital emergency hydraulic pressure. But it might have been because he was also qualified for engine run in the C-130B, on which the ATM does not supply hydraulic pressure to the emergency brakes.

Maintenance personnel and aircrews should always maintain a thorough knowledge of aircraft systems. Would you have corrective actions immediately in mind should a similar incident occur on your bird?

Near Miss

As he approached the two-mile point on an ILS approach to runway 13, tower advised a turboprop pilot that a light aircraft was departing runway 17. Spotting the light plane, the pilot continued the approach. At 400 feet, he decided to execute a missed approach and started a right climbing turn to the southwest. At 2,000 feet the turboprop pilot took evasive action as the light aircraft reappeared off his left side. The two aircraft missed each other by an estimated 1,000 feet. The weather at the time of the near miss: 3,000 feet scattered, 7 miles visibility and light winds.



Until electronic collision avoidance equipment is perfected, Air Force crews must remain vigilant for air traffic. The see-and-be-seen concept is the key. Pilots who are busy flying instruments should consider stationing additional scanners where they can help clear for other aircraft.

Tailwind Touchdown

The aircraft was flying a PAR approach in a thunderstorm infested area with gusty crosswinds that were barely within limits for the aircraft. Approach Control directed the pilot to execute a missed approach for traffic spacing. The pilot complied. Trying to beat the thunderstorms, only a mile away, the pilot entered a VFR downwind. On final approach, a gusty tail-wind, estimated at 65 knots, hit the aircraft, causing it to land well short of the runway. There were no injuries, but the aircraft was badly damaged.

The weather briefer, prior to the training flight, had warned the pilot of the thunderstorm activity and had forecast gusty winds above the design limits of the aircraft. But the pilot phoned the destination weather station to get the "real" weather conditions. The destination weather station forecast thunderstorms, but expected them after the pilot's estimated arrival time. Enroute, the pilot neglected to update his weather briefings except for receiving sketchy weather reports offered by air traffic control agencies.

Just five minutes prior to landing, the pilot was advised of severe weather at another airport, three miles west of the base. Winds were reported gusting to 45 knots. The pilot continued his approach and pranged.

This pilot learned the hard way that one can't bargain for better weather conditions, and gambling against the odds offered by severe weather forecasts can result in heavy losses.

Qs —continued

Aluminum Undercast

Ever wondered exactly how large the Boeing 747 is? A Canadian aircraft was flying over the Atlantic on a clear night at FL 370 with all quiet, when suddenly both radio altimeter pointers went to 1,900 feet and all MDA lights came on for about five seconds. The crew immediately looked out to check that the Atlantic was still well below and a few moments later a Boeing 747 at FL 350 appeared, as it passed them eastbound.

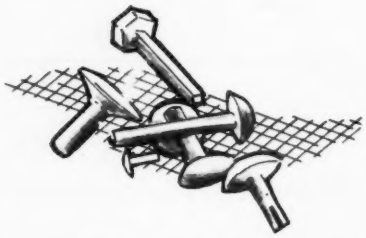
— FLIGHT SAFETY FACTS AND ANALYSIS

Itty Bitty Rivet

A four-engine jet took off from a civilian base but after the copilot attempted to retract the landing gear, the nose gear indicator showed an intermediate position.

The aircraft climbed to 10,000 feet and entered a holding pattern where the crew began trouble-shooting. A crew member visually checked the nose gear and reported it was partially extended. Attempts to insert the nose gear downlock pin failed. The pilot recycled the landing gear lever several times but the nose gear would not go up or down.

The crew contacted civilian maintenance personnel who recommended various procedures for gear lowering. But the stubborn nose gear refused to budge. Maintenance felt that the nose gear strut was over center and would maintain its position during landing.



The crew initiated "conference" procedures with their command after which runway foaming operations began. The crew transferred and adjusted fuel quantity in the wing tanks to minimize aircraft weight on the nose gear during landing.

Three hours after takeoff, the pilot made a successful landing and stopped the aircraft on the runway. Civilian maintenance personnel forced a slender pin through the partially exposed gear down lock hole.

A small steel rivet found in the nose gear mechanism had caused the gear to jam in the intermediate position.

Everyone is capable of producing FOD, but some are more so than others. The guy who goes out to rivet an airplane together is in a business where FOD becomes of particular significance and he should have a spillproof container for his FOD stuff.

after deadline . . .

NEXT MONTH -- Feature articles next month include:

* MATS/MAC FLYER in review -- A look at some of the highlights from the first 20 years.

* Macumsized Hueys -- The SAC missile support mission is more varied than you might think, and the crews make it look like a joint command effort.

* Whatever Happened to CAM? -- Combat airlift is alive and well. How has the mission changed? Who are flying the missions?

* Going Missed Approach -- A fictitious article on misconceptions about the circling approach.

WATCH THE TRIM -- In March, a C-141 crew experienced a runaway nose-up hydraulic pitch trim emergency. The crew managed to disconnect the pitch trim and the number two hydraulic system, reconnect the electric trim, and run the trim back down electrically to a safe regime -- all while the aircraft was shooting skyward in a tight spiral. Since that time, the aircraft has experienced two more erratic pitch trim incidents. After the second incident, investigators found shorted wires in the copilot's yoke and believed these had given stray commands to the trim system. However, the last incident occurred after the shorted wires had been repaired. The matter is still under investigation by WRAMA. Results of the latest study were not known at press time.

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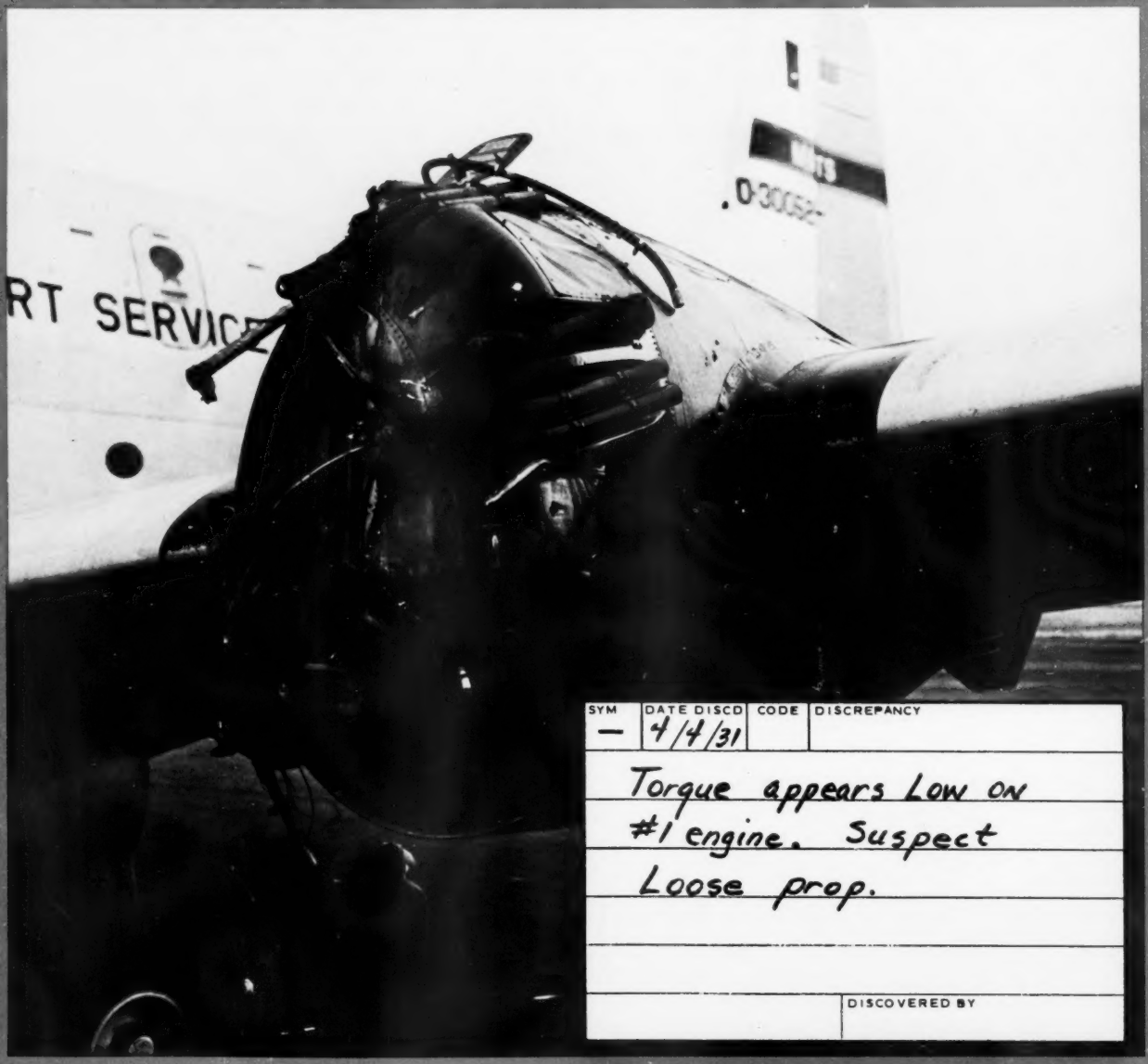
the ANALYZER



SYM	DATE DISCD	CODE	DISCREPANCY
—	4/4/31		

Torque appears Low on #1 engine. Suspect Loose prop.

DISCOVERED BY